

EXHIBIT D

The IEEE Standard Dictionary of Electrical and Electronics Terms

Sixth Edition

**Standards Coordinating Committee 10, Terms and Definitions
Jane Radatz, Chair**

This standard is one of a number of information technology dictionaries being developed by standards organizations accredited by the American National Standards Institute. This dictionary was developed under the sponsorship of voluntary standards organizations, using a consensus-based process.

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Introduction

Since the first edition in 1941 of the American Standard Definitions of Electrical Terms, the work now known as IEEE Std 100, The IEEE Standard Dictionary of Electrical and Electronics Terms, has evolved into the unique compendium of terms that it is today.

The current edition includes all terms defined in approved IEEE standards through December 1996. Terms are categorized by their technical subject area. They are also associated with the standards or publications in which they currently appear. In some cases, terms from withdrawn standards are included when no current source can be found. Earlier editions of IEEE Std 100 included terms from sources other than IEEE standards, such as technical journals, books, or conference proceedings. These terms have been maintained for the sake of consistency and their sources are listed with the standards in the back of the book.

The practice of defining terms varies from standard to standard. Many working groups that write standards prefer to work with existing definitions, while others choose to write their own. Thus terms may have several similar, although not identical, definitions. Definitions have been combined wherever it has been possible to do so by making only minor editorial changes. Otherwise, they have been left as written in the original standard.

Users of IEEE Std 100 occasionally comment on the surprising omission of a particular term commonly used in an electrical or electronics field. This occurs because the terms in IEEE Std 100 represent only those defined in the existing or past body of IEEE standards. To respond to this, some working groups obtain authorization to create a glossary of terms used in their field. All existing, approved standard glossaries have been incorporated into this edition of IEEE Std 100, including the most current glossaries of terms for computers and power engineering.

IEEE working groups are encouraged to refer to IEEE Std 100 when developing new or revised standards to avoid redundancy. They are also encouraged to investigate deficiencies in standard terms and create standard glossaries to alleviate them.

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How to use this dictionary

The terms defined in this dictionary are listed in *letter-by-letter* alphabetical order. Spaces are ignored in this style of alphabetization, so *cable value* will come before *cab signal*. Descriptive categories associated with the term in earlier editions of IEEE Std 100 will follow the term in parentheses. New categories appear after the definitions (see Categories, below), followed by the designation of the standard or standards that include the definition. If a standard designation is followed by the letter *s*, it means that edition of the standard was superseded by a newer revision and the term was not included in the revision. If a designation is followed by the letter *w*, it means that edition of the standard was withdrawn and not replaced by a revision. A bracketed number refers to the non-IEEE standard sources given in the back of the book.

Acronyms and abbreviations are no longer listed in a separate section in the dictionary; rather, they are incorporated alphabetically with other terms. Each acronym or abbreviation refers to its expanded term, where it is defined. Acronyms and abbreviations for which no definition was included in past editions have been deleted from this edition of IEEE Std 100.

Abstracts of the current set of approved IEEE standards are provided in the back of the book. It should be noted that updated information about IEEE standards can be obtained at any time from the IEEE Standards World Wide Web site at <http://standards.ieee.org/>.

Categories

The category abbreviations that are used in this edition of IEEE Std 100 are defined below. This information is provided to help elucidate the context of the definition. Older terms for which no category could be found have had the category "Std100" assigned to them. Note that terms from sources other than IEEE standards, such as the National Electrical Code® (NEC®) or the National Fire Protection Association, may not be from the most recent editions; the reader is cautioned to check the latest editions of all sources for the most up-to-date terminology.

automated office

tral component in a machine-aided translation system. *See also:* automated dictionary; automated glossary.

(C) 610.2-1987

automated office *See:* electronic office.

automated teller machine (ATM) An unattended terminal-type device that offers simple banking services such as cash withdrawals, transfer of funds between accounts, and account balance inquiry. *Synonym:* customer-bank communication terminal.

(C) 610.2-1987

automated test case generator *See:* automated test generator.

automated test data generator *See:* automated test generator.

automated test generator (software) A software tool that accepts as input a computer program and test criteria, generates test input data that meet these criteria, and, sometimes, determines the expected results. *See also:* computer program; data.

(C/SE) 729-1983s

automated thesaurus In machine-aided translation, a computer-resident thesaurus used in conjunction with an automated lexicon to handle words with multiple meanings.

(C) 610.2-1987

automated verification system (A) (software) A software tool that accepts as input a computer program and a representation of its specification, and produces, possibly with human help, a proof or disproof of the correctness of the program.

(B) (software) Any software tool that automates part or all of the verification process.

(C) 610.12-1990

automated verification tools (software) A class of software tools used to evaluate products of the software development process. These tools aid in the verification of such characteristics as correctness, completeness, consistency, traceability, testability, and adherence to standards. Examples are design analyzers, automated verification systems, static analyzers, dynamic analyzers, and standards enforcers. *See also:* automated verification system; correctness; design analyzer; dynamic analyzer; software development process; static analyzer; testability; tool; verification.

(C/SE) 729-1983s

automatic (1) Pertaining to a function, operation, process, or device that, under specified conditions, functions without intervention by a human operator.

(C/PE/SUB) 610.10-1994, 610.2-1987, C37.1-1987s

(2) Self-acting, operating by its own mechanism when actuated by some impersonal influence—as, for example, a change in current strength; not manual; without personal intervention. Remote control that requires personal intervention is not automatic, but manual.

(NESC/T&D) C2-1997, C2.2-1960

(3) Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature, or mechanical configuration. *See also:* nonautomatic.

(IA/NEC/NESC) [60], [86]

(4) Pertaining to a process or device that, under specified conditions, functions without intervention by a human operator.

(PE/SWG) C37.100-1992

automatic abstracting In library automation, the automatic selection of words and phrases from a document to produce an abstract.

(C) 610.2-1987

automatic acceleration (1) (automatic train control) Acceleration under the control of devices that function automatically to maintain, within relatively close predetermined values or schedules, current passing to the traction motors, the tractive force developed by them, the rate of vehicle acceleration, or similar factors affecting acceleration. *See also:* electric drive; multiple-unit control.

(EEC/PE) [119]

(2) Acceleration under the control of devices that function automatically to raise the motor speed. *See also:* electric drive; multiple-unit control.

(IA) [60]

Automatically Programmed Tools (APT) (1) A problem-oriented programming language used for programming numerically controlled machine tools.

(C) 610.13-1993

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automatic combustion control

(2) A programming system using English-like symbolic descriptions of part and tool geometry and tool motion for numerical control.

(C) 610.2-1987

automatically regulated (rotating machinery) Applied to a machine that can regulate its own characteristics when associated with other apparatus in a suitable closed-loop circuit.

(PE) [9]

automatically reset relay *See:* self-reset relay.

automatic approach control A system that integrates signals, received by localizer and glide path receivers, into the automatic pilot system, and guides the airplane down the localizer and glide path beam intersection.

(EEC/PE) [119]

automatic bias nulling A circuit or system technique for setting the mean value of sensor output, averaged over a defined time period, to zero, or to some defined value.

(AE) 528-1994

automatic block signal system A series of consecutive blocks governed by block signals, cab signals, or both, operated by electric, pneumatic, or other agency actuated by a train or by certain conditions affecting the use of a block. *See also:* block-signal system.

(EEC/PE) [119]

automatic cab signal system A system that provides for the automatic operation of cab signals. *See also:* automatic train control.

(EEC/PE) [119]

automatic calendar A component of some office automation systems that allows users to store their appointments in a database and to set up meetings by requesting a search for an available meeting time in each of the participants' calendars.

(C) 610.2-1987

automatic call distribution A service that evenly distributes calls among incoming end user lines.

(AMR) 1390-1995

automatic call distributor (telephone switching systems) The facility for allotting incoming traffic to idle operators or attendants.

(COM) 312-1977w

automatic capacitor control equipment A piece of equipment that provides automatic control for functions related to capacitors, such as their connection to and disconnection from a circuit in response to predetermined conditions such as voltage, load, or time.

(PE/SWG) C37.100-1992

automatic carriage (1) A control mechanism for a typewriter or other output device that can automatically control the feeding, spacing, skipping and ejecting of paper and preprinted forms.

(C) [20], 610.10-1994

(2) Pertaining to a function, operation, process, or device that, under specified conditions, functions without intervention by a human operator.

(C) 610.10-1994

automatic chart-line follower (navigation aid terms) A device that automatically derives error signals proportional to the deviation of the position of a vehicle from a predetermined course line drawn on a chart.

(AE) 172-1983w

automatic check A check that is built into a device in order to verify the accuracy of information transmitted, manipulated, or stored by that device. *Synonyms:* built-in check; hardware check.

(C) 610.10-1994, 610.5-1990

automatic circuit closer (supervisory control, data acquisition, and automatic control) A self-controlled device for automatically interrupting and reclosing an alternating-current circuit, with a predetermined sequence of opening and reclosing followed by resetting, hold-closed, or lockout operation.

(PE/SUB) C37.1-1987s

automatic circuit recloser A self-controlled device for automatically interrupting and reclosing an alternating-current circuit, with a predetermined sequence of opening and reclosing followed by resetting, hold-closed, or lockout operation. *Note:* When applicable, it includes an assembly of control elements required to detect overcurrents and control the recloser operation.

(PE/SWG/SUB) C37.1-1987s, C37.100-1992

automatic combustion control A method of combustion control that is effected automatically by mechanical or electric devices.

(PE/T&D) [10]

automatic component inter

automatic component inter system for connecting input ing components according to This system, which may c and/or electronic switches patch boards and patch cord autopatch. *See also:* proble

automatic computer* A com of operations without interv

* Deprecated.

automatic control (1) (excit machines) In excitation con trol refers to maintaining syn age without operator action synchronous machine with regulation under automatic action of reactive or active l trol elements; or may be coi limiters included in the exci

(2) (analog computer) In a computer operation using a perform computer-control s tions, or component adjust ously selected criteria. Suc usually consists of program the analog, a separate digita the digital computer contro example of a hybrid compu (3) (electrical controls) A switching or otherwise con sequence and under predete devices comprising an equip upon maintain the required adequate protection against

(4) (computers) Describes erating without external or h merical control; process con

(5) An arrangement of elec switching or otherwise con sequence and under predete devices comprising a piece thereupon maintain the requi vide adequate protection ag encies.

(PE/SWG/SU

automatic control equipment acquisition) Equipment tha power apparatus in response

(2) Equipment that provides type of power circuit or app

automatic controller (electric ing furnaces and forehear cess control) (emergency ar operates automatically to reg sponse to a command and a troller, automatic.

automatic data processing (A by a computer system. Synon electronic data processing.

automatic direct-control tele phone switching systems) tions are set directly in respo nating calling device.

automatic direction finder (n finder that automatically and of the direction of arrival c usually displayed visually.

a Overrun Error (DOR) bit

session layer; sublayer; trans-
(C) 610.7-1995

ontrol or processing logic exist-
of a station that is responsible
data link. The data link layer
between the station higher
ese functions include address/
channel access and command
sending, and interpretation.

(C/LM) 8802-2-1994
DLSAP The point at which
a Link layers occurs. In IEEE
ve DLSAPs.

(EMB) 1073.3.1-1994
ommunication A system to
and make a written tabulation
for computer input. *See also*:
(PE) 599-1985w

DUs from the network and
ording to either the time se-
ginally received or the time
time stamps.

(C/DIS) 1278.3-1996
ontrol, data acquisition, and
ng of selected data on suitable

(PE/SUB) C37.1-1994
numerical representation of
ts; papers, magnetic tape, or
typewriter or other suitable
(PE/SWG) C37.100-1992

nt for numerical recording of
or paper or magnetic tape or
typewriter or other suitable
SWG) [56], C37.100-1981s
f controlling the acquisition,
distribution of data.

(C) 610.5-1990
ML A language used to re-
the data in a database. *Syn-*
guage. *Contrast*: data defi-
Datatrieve; dBASE; DL/I;

MODEL 204; NATURAL;
) 610.13-1993, 610.5-1990
1 which data are or may be
ier; media; prerecorded data

) 610.10-1994, 610.5-1990
ta that consists of all entities
r database and the relation-
e *also*: logical data model;
ew.

(C) 610.5-1990
of the information require-
ionships for an organization,
(PE) 1150-1991

permits two or more data
mission medium.

(C) 610.7-1995
used to identify a data ele-
(C) 610.5-1990

tion.

rrorboration that the source
his service, when provided
the corroboration to an
the data is the claimed peer
(C/LM) 802.10-1992

mory The outputs whose
n the memory.

(C/TT) 662-1980s
bit in the Bus Error register
sets this bit to indicate that
a from the M-module when
ceive it.

(C/TT) 1149.5-1995

DATA packet

DATA packet Any packet other than a HEADER, PACKET
COUNT, or ACKNOWLEDGE packet.

(C/TT) 1149.5-1995

data path Signal lines on a bus associated with data.

(C/MM) 959-1988r

data phase A period within a transaction used to transfer data.
(BA/C) 10857-1994, 896.3-1993, 896.4-1993

data processing (DP) (1) The systematic performance of op-
erations upon data, such as data manipulation, merging,
sorting, and computing. *Synonym*: information processing.
See also: administrative data processing; automatic data pro-
cessing; business data processing; commercial data process-
ing; distributed data processing; integrated data processing;
mechanical data processing; office automation; remote-access
data processing. (C) 610.2-1987

(2) **(emergency and standby power)** Pertaining to any op-
eration or combination of operations on data.

(IA) 446-1987s

data processing cycle *See*: processing cycle.

data processing system A system, including computer systems
and associated personnel, that performs input, processing,
storage output, and control functions to accomplish a se-
quence of operations on data. *See also*: information system.
(C) 610.10-1994, 610.2-1987

data processor* (1) (A) A processor capable of performing
operations on data. For example: a desk calculator or tabu-
lating machine, or a computer. (B) A person who operates a
computer. (C) 610.10-1994

(2) Any device capable of being used to perform operations
on data, for example, a desk calculator, tape recorder, analog
computer, or digital computer. (IA) 446-1987s

* Deprecated.

data producer certification The determination by the data
producer that data have been verified and validated against
documented standards of criteria. (C/DIS) 1278.3-1996

data quality *See*: data integrity.

data quality objective The qualitative and quantitative state-
ments that specify the quality of data required to support de-
cisions for any process requiring radiochemical analysis (ra-
dioassay). (NI) N42.23-1995

data rate (1) The rate at which a data path (e.g., a channel)
carries data, measured in bits per second (b/s).

(EMB/PE/SWG/SUB) 1073.3.1-1994, 1073.4.1-1994,
999-1992, C37.1-1994, C37.100-1992

(2) *See also*: transfer rate. (C) 610.7-1995

data reconstruction (date processing) The conversion of a sig-
nal defined on a discrete-time argument to one defined on a
continuous-time argument. (IM) [52]

data record *See*: record.

data reduction (1) The transformation of raw data into a more
useful form, for example, smoothing to reduce noise.

(MIL) [2]

(2) **(data management)** Any technique used to transform
data from raw data into a more useful form of data. For ex-
ample, grouping, summing, or averaging related data.

(C) 610.5-1990

data resource A purposely organized body of data that
is of use to some person or group of people.

(C) 610.5-1990

data security The degree to which a collection of data is pro-
tected from exposure to accidental or malicious alteration or
destruction. *See also*: data integrity; database security.

(C) 610.5-1990

data-sensitive fault A fault that causes a failure in response to
some particular pattern of data. *Synonym*: pattern-sensitive
fault. *Contrast*: program-sensitive fault. (C) 610.12-1990

data service unit A device that provides bipolar conversion
functions to ensure proper signal shaping and adequate signal
strength in a digital communications environment. *See also*:
channel service unit. (C) 610.7-1995

data set (1) (data management) A named collection of related
records. *Synonym*: file. *See also*: partitioned data set.

(C) 610.5-1990

(2) **(data transmission)** A modem serving as a conversion
element and interface between a data machine and commu-
nication facilities. *See also*: modem. (PE) 599-1985w

data signaling rate The rate of data transmission, generally
expressed as bits per second. *See also*: baud rate.

(C) 610.10-1994, 610.7-1995

data sink (1) (data transmission) The equipment which ac-
cepts data signals after transmission. (PE) 599-1985w

(2) The functional unit that accepts transmitted data. *Con-*
trast: data source. (C) 610.7-1995

data source (1) (data transmission) The equipment which sup-
plies data signals that enter into a data link.

(PE) 599-1985w

(2) The functional unit that originates data for transmission.
Contrast: data sink. (C) 610.7-1995

data space The address space which devices may have that is
recommended for use in data operations. There are few con-
straints applied to data space uses. *See also*: CSR space.

960-1993

data stabilization (navigation aid terms) (vehicle-borne nav-
igation systems) The stabilization of the output signals with
respect to a selected reference invariant with vehicle orien-
tation. (AE) 172-1983w

data stack A stack that may be used for passing parameters
between Forth definitions. (BA/C) 1275-1994

data station *See*: station.

data storage description language A language used to define
the organization of stored data in terms that are independent
of any particular storage device or operating system.

(C) 610.5-1990

data storage schema A data structure that describes the manner
in which data items are physically stored in storage. *See also*:
database definition. (C) 610.5-1990

data stream (A) All data that is transmitted through an input-
output channel in a single read or write operation. (B) A con-
tinuous stream of data elements being transmitted, or intended
for transmission. (C) 610.10-1994

data striping RAID storage A form of RAID storage, known
as level 0, in which data is striped across the multiple drives
by system block size. *Note*: No parity check is performed.

(C) 610.10-1994

data structure (data management) (software) A physical or
logical relationship among data elements, designed to support
specific data manipulation functions. *Synonym*: logical struc-
ture. (C) 610.12-1990, 610.5-1990

data structure-centered design A software design technique
in which the architecture of a system is derived from analysis
of the structure of the data sets with which the system must
deal. *See also*: input-process-output; modular decomposition;
object-oriented design; rapid prototyping; stepwise refine-
ment; structure clash; structured design; transaction analysis;
transform analysis. (C) 610.12-1990

data structure diagram A diagram that depicts a set of data
elements, their attributes, and the logical relationships among
them. *Contrast*: data flow diagram. *See also*: entity-rela-
tionship diagram.

Employee Record									
Emp. No. (4)	Emp. Name			Emp. Address				Dept. No. (3)	Emp. Sal. (4)
	First (10C)	Mid. (1C)	Last (16C)	Street (20C)	City (20C)	State (2C)	Zip (9)		

I = Integer C = Character

data structure diagram

(C) 610.12-1990

data sublanguage (DSL) A subset of another language, called
the host language, that is used to perform database operations.
Synonym: database sublanguage. (C) 610.5-1990

wathour meter designation

electrometer tube

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electronic funds transfer system

wanted electromagnetic tidal character. *See also:* electromagnetic (EMC) [53], [70] time-varying electromagnetic waves not convey information and or combined with a wanted (PE/T&D) 539-1990

(1) A transient high-intensity commonly associated with nuclear Earth's atmosphere; however, from other sources, such as (AP) 211-1990

etic pulse initiated by a nuclear detonation of a nuclear (PE) 1143-1994

(radio frequency radiation) term is restricted to that part defined as the radio frequency of this standard includes microwave (NIR) C95.2-1982r

netic energy from a finite reaves. (AP) 145-1983s

energy consisting of orthogonagnetic fields lying transverse n. X rays, ultraviolet, visible, y various portions of the electron only in frequency and wave- (LEO) 586-1980w

mechanical relay that operates electromagnetic element that is (PE/SWG) C37.100-1992

lligence, message, or effect to cation system or broadcasting ves. (PE/T&D) 539-1990

dio-wave propagation) The idiation, consisting of: gamma 1 0.006 nm; X rays, 0.006 to 0.4 μm ; visible light, 0.4 to 1 mm; radio, greater than 0.1 (AP) 211-1990

es characterized by variations *Note:* Electromagnetic waves t rays, light rays, etc., depend- so: propagation; radio wave; (MTT) 146-1980w

Waves characterized by tem- electric and magnetic fields. own as radio waves, infrared ding on the frequency. (AP) 211-1990

rol equipment) A device that s mechanical motion such as (PE) 94-1970w

icsimile) Recording by means il device. *See also:* recording. (COM) 168-1956w

ty that operates by physical rom electromagnetic, electro- created by the input quantities. (PE/SWG) C37.100-1992

ystem (telephone switching ig system in which the control ally by electromechanical de- (COM) 312-1977w

A transducer for receiving and delivering waves to a me- *See also:* transducer. 3/SP/T&D) [32], 590-1977r

eter designation The maxi- es at which a wathour meter

meets the accuracy of ANSI C12.1-1988, or the latest revision thereof. (ELM) C12.10-1987

electrometer tube A vacuum tube having a very low control-electrode conductance to facilitate the measurement of extremely small direct current or voltage. (ED) [45], 161-1971w

electromotive force *See:* voltage.

electromotive force series A list of elements arranged according to their standard electrode potentials. (IA) [59], [71]

electromyograph (medical electronics) An instrument for recording action potentials or physical movements of muscles. (EMB) [47]

electron (1) An elementary particle containing the smallest negative electric charge. *Note:* The mass of the electron is approximately equal to 1/1837 of the mass of the hydrogen atom. (Std100) [84]

(2) Operated by, containing, or producing electrons. Examples: Electron tube, electron emission, and electron gun. *See also:* electronic; electronics. (BEC/PE) [119]

electron accelerator, linear *See:* linear electron accelerator.

electronarcosis The production of transient insensibility by means of electric current applied to the cranium at intensities insufficient to cause generalized convulsions. *See also:* electrotherapy. (EMB) [47]

electron beam A beam of electrons (ions) emitted from a single source and moving in neighboring paths that are confined to a desired region. (Std100) [84]

electron beam recording (EBR) In micrographics, a specific method of producing computer output microfilm in which a beam of electrons is directed onto an energy-sensitive microfilm. (C) 610.2-1987

electron-beam tube An electron tube, the performance of which depends upon the formation and control of one or more electron beams. (ED) 161-1971w

electron collector (microwave tubes) The electrode that receives the electron beam at the end of its path. *Note:* The power of the beam is used to produce some desired effect before it reaches the collector. *See also:* velocity-modulated tube. (Std100) [84]

electron-coupled oscillator An oscillator employing a multi-grid tube with the cathode and two grids operating as an oscillator in any conventional manner, and in which the plate circuit load is coupled to the oscillator through the electron system. *See also:* oscillatory circuit. (AP/BT) 145-1983s, 182-1961w

electron (proton) damage coefficient The change in a stated quantity (such as minority carrier inverse squared diffusion length) of a given material per unit particle fluence of a stated energy spectrum. (AE) 307-1969w

electron device A device in which conduction is principally by electrons moving through a vacuum, gas, or semiconductor. (ED) 161-1971w

electron-device transducer *See:* admittance, short-circuit forward.

electron emission The liberation of electrons from an electrode into the surrounding space. *Note:* Quantitatively, it is the rate at which electrons are emitted from an electrode. (ED) 161-1971w

electron gun (1) (electron tube) An electrode structure that produces and may control, focus, deflect, and converge one or more electron beams. *See also:* electrode. (ED) 161-1971w

(2) (computer graphics) A device in a cathode ray tube that emits a stream of electrons that is directed by the deflection system toward the phosphor-coated screen. *See also:* flood gun. (C) 610.6-1991

electron-gun density multiplication (electron tube) The ratio of the average current density at any specified aperture through which the stream passes to the average current density at the cathode surface. (ED) 161-1971w

electronic Of, or pertaining to, devices, circuits, or systems utilizing electron devices. Examples: Electronic control, elec-

tronic equipment, electronic instrument, and electronic circuit. *See also:* electron device; electronics.

(ED) 161-1971w

electronically de-spun antenna (communication satellite) A directional antenna, mounted to a rotating object (namely spin stabilized communication satellite), with beam switching and phasing such that the antenna beam points into the same direction in space regardless of its mechanical rotation. (COM) [24]

electronic analog computer An automatic computing device that operates in terms of continuous variation of some physical quantities, such as electric voltages and currents, mechanical shaft rotations, or displacements, and that is used primarily to solve differential equations. *Note:* The equations governing the variation of the physical quantities have the same or very nearly the same form as the mathematical equations under investigation and therefore yield a solution analogous to the desired solution of the problem. Results are measured on meters, dials, oscillograph recorders, or oscilloscopes. (C) 165-1977w

electronic bulletin board In an electronic mail system, a storage area shared by several users, each having access to all messages left in that area. (C) 610.2-1987

electronic cash register (ECR) A device that functions as both a cash register and a point-of-sale terminal to a central computer performing inventory control, price updating, and other retail sales functions. (C) 610.2-1987

Electronic Circuit Analysis Program II (ECAP II) A simulation language used for modeling and analyzing electrical networks, allowing synthesis of device models using a function generator. (C) 610.13-1993

electronic contactor A contactor whose function is performed by electron tubes. *See also:* contactor. (IA) [60]

electronic controller An electric controller in which the major portion or all of the basic functions are performed by electron tubes. (IA) [60]

electronic counter-countermeasures (ECCM) Any electronic technique designed to make a radar less vulnerable to electronic countermeasures (ECM). (AE) 686-1990w

electronic counter-countermeasures improvement factor (radar) The power ratio of the electronic countermeasures (ECM) signal level required to produce a given output signal from a receiver using an ECCM technique to the ECM signal level producing the same output from the same receiver without the ECCM technique. (AE) 686-1982s

electronic countermeasures (ECM) Any electronic technique designed to deny detection or accurate information to a radar. Screening with noise, confusion with false targets, and deception by affecting tracking circuits are typical types. (AE) 686-1990w

electronic data processing *See:* automatic data processing.

Electronic Design Interchange Format (EDIF) An industry standard for transfer of schematic and structured connectivity information for electronic design automation. (ATL) 1232-1995

electronic direct-current motor controller A phase-controlled rectifying system using tubes of the vapor- or gas-filled variety for power conversion to supply the armature circuit or the armature and shunt-field circuits of a direct-current motor, to provide adjustable-speed, adjustable- and regulated-speed characteristics. *See also:* electronic controller. (IA) [60]

electronic direct-current motor drive The combination of an electronic direct-current motor controller with its associated motor or motors. *See also:* electronic controller. (IA) [60]

electronic efficiency (electron tube) The ratio of the power at the desired frequency delivered by the electron stream to the circuit in an oscillator or amplifier to the average power supplied to the stream. (ED) 161-1971w

electronic funds transfer system A data collection and telecommunication system that electronically transports infor-

Process

822

process metric

ecuting within that address space and their required system resources. *Note:* The term process is used in contrast to "system process," or the OSI usage of the term "application process."

(C/PA) 1224.2-1993, 1326.2-1993, 1327.2-1993, 1328.2-1993

(9) An organized set of activities performed for a given purpose; for example, the software development process.

(C/SE) J-STD-016:1995

(10) A unit of activity characterized by a single sequential thread of execution, a current state, and an associated set of system resources.

(C/MM) 855-1990

(11) *See also:* POSIX process. (C/PA) 1003.5b-1995

Process A function that must be performed in the software life cycle. A Process is composed of Activities.

(C/SE) 1074-1995

processable scored card A scored card including at least one separable part that can be processed after separation. *See also:* stub card.

(C) 610.10-1994

Process and Experiment Automation Realtime Language (PEARL) A general-purpose, high-order language designed to meet the requirements of real-time programming in process and experiment automation.

(C) 610.13-1993

Process Architect The person or group that manages the implementation of the Standard in an organization.

(C/SE) 1074.1-1995

process bound *See:* compute-bound.

process control (1) (electric pipe heating systems) The use of electric pipe heating systems to increase or maintain, or both, the temperature of fluids (or processes) in mechanical piping systems including pipes, pumps, tanks, instrumentation in nuclear power generating stations.

(PE) 622A-1984r

(2) **(automatic control)** Control imposed upon physical or chemical changes in a material. *See also:* control system, feedback.

(PE) [3]

(3) **(electric heat tracing systems)** The use of electric heat tracing systems to increase or maintain, or both, the temperature of fluids (or processes) in mechanical piping systems including pipes, pumps, valves, tanks, instrumentation, etc, in power generating stations.

(PE) 622B-1988r

(4) Automatic control in which a computer is used to regulate continuous operations such as chemical processes, military operations, or manufacturing operations. *See also:* numerical control.

(C) 610.2-1987

process equipment (automatic control) Apparatus with which physical or chemical changes in a material are produced. *Synonym:* plant.

(PE) [3]

process group A collection of processes that permits the signaling of related processes. Each process in the system is a member of a process group that is identified by a process group ID. A newly created process joins the process group of its creator.

(C/PA) 1003.5-1992, 1003.5b-1995, 9945-1-1996, 9945-2-1993

process group ID (1) The unique identifier representing a process group during its lifetime. A process group ID is a positive integer that can be contained in a *pid.t*. It shall not be reused by the system until the process group lifetime ends.

(C/PA) 9945-1-1996, 9945-2-1993

(2) A unique value identifying a process group during its lifetime. A process group ID shall not be reused by the system until the process group lifetime ends.

(C/PA) 1003.5-1992, 1003.5b-1995

process group leader (1) A process whose process ID is the same as its process group ID.

(C/PA) 9945-1-1996, 9945-2-1993

(2) A process whose process ID matches the process ID of the process group leader for all members of the process group.

(C/PA) 1003.5-1992

(3) The unique process, within a process group, that created the process group.

(C/PA) 1003.5b-1995

process group lifetime (1) A period of time that begins when a process group is created and ends when the last remaining

process in the group leaves the group, due either to the end of the last process's process lifetime or to the last remaining process calling the *setsid()* or *setpgid()* functions.

(C/PA) 9945-1-1996

(2) A period of time that begins when a process group is created and ends when the last remaining process in the group leaves the group, due either to the end of the process lifetime of the last process or to the last remaining process calling the *Set_Process_Group_ID* procedure.

(C/PA) 1003.5-1992, 1003.5b-1995

process ID (1) The unique identifier representing a process. A process ID is a positive integer that can be contained in a *pid.t*. A process ID shall not be reused by the system until the process lifetime ends. In addition, if there exists a process group whose process group ID is equal to that process ID, the process ID shall not be reused by the system until the process group lifetime ends. A process that is not a system process shall not have a process ID of 1.

(C/PA) 9945-1-1996, 9945-2-1993

(2) A unique value identifying a process during its lifetime. The process ID is defined in the package *POSIX_Process_Identification*. A process ID shall not be reused by the system until the process lifetime ends. In addition, if there exists a process group where the process ID of the process group leader is equal to that process ID, that process ID shall not be reused by the system until the process group lifetime ends. An implementation shall reserve a value of process ID for use by system processes. A process that is not a system process shall not have this process ID.

(C/PA) 1003.5-1992, 1003.5b-1995

processing *See:* data processing; information processing; multiprocessing; parallel processing.

processing cycle A single, complete execution of data processing that is periodically repeated. *Synonym:* data processing cycle. *See also:* annual cycle; daily cycle; monthly cycle; weekly cycle.

(C) 610.2-1987

processing unit A functional unit that consists of one or more processors and their storage. *See also:* central processing unit.

(C) 610.10-1994

process lifetime (1) The period of time that begins when a process is created and ends when its process ID is returned to the system. After a process is created with a *fork()* function, it is considered active. At least one thread of control and the address space exist until it terminates. It then enters an inactive state where certain resources may be returned to the system, although some resources, such as the process ID, are still in use. When another process executes a *wait()* or *waitpid()* function for an inactive process, the remaining resources are returned to the system. The last resource to be returned to the system is the process ID. At this time, the lifetime of the process ends.

(C/PA) 9945-1-1996

(2) A period of time that begins when a process is created and ends when its process ID is returned to the system. After a process is created, it is considered active. Its threads of control and address space exist until it terminates. It then enters an inactive state where certain resources may be returned to the system, although some resources, such as the process ID, are still in use. When another process executes a *Wait_For_Child_Process* procedure for an inactive process, the remaining resources are returned to the system. The last resource to be returned to the system is the process ID. At this time, the lifetime of the process ends.

(C/PA) 1003.5-1992, 1003.5b-1995

process list An ordered set of runnable processes that all have the same ordinal value for their priority. The ordering of processes on the list is determined by a scheduling policy or policies. The set of process lists includes all runnable processes in the system.

(C/PA) 1003.1b-1993s

process management The direction, control, and coordination or work performed to develop a product or perform a service. Example is quality assurance.

(C) 610.12-1990

process metric A metric used to measure characteristics of the methods, techniques, and tools employed in developing, im-

EXHIBIT E

McGraw-Hill Dictionary of Scientific and Technical Terms

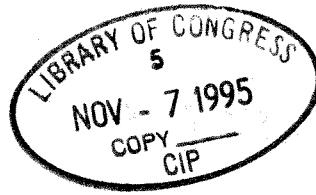
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On the cover: Photomicrograph of crystals of vitamin B₁.
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within the body or transferred from one part of the body to another. { 'öd-ö, in'fek-shən }

autoinjection See autoinjection. { 'öd-ö, in'jek-shən }

autoinoculation [MED] 1. Spread of a disease from one part of the body to another. 2. Injection of an autovaccine. { 'öd-ö, in, äk-yä'lä-shən }

autointoxication [MED] Poisoning by metabolic products elaborated within the body; generally, toxemia of pathologic states. { 'öd-ö, in, täk-sä'kä-shən }

autointrusion [GEOL] A process wherein the residual liquid of a differentiating magma is drawn into rifts formed in the crystal mesh at a late stage by deformation of unspecified origin. Also known as autoinjection. { 'öd-ö, in'trü-zhən }

autoionization [ATOM PHYS] The radiationless transition of an electron in an atom from a discrete electronic level to an ionized continuum level of the same energy. Also known as preionization. { 'öd-ö, i-ä-nä'zä-shən }

autolith [PETR] 1. A fragment of igneous rock enclosed in another igneous rock of later consolidation, each being regarded as a derivative from a common parent magma. 2. A round, oval, or elongated accumulation of iron-magnesium minerals of uncertain origin in granitoid rock. { 'öd-ö, lith }

autolithography [GRAPHICS] A lithographic process in which the artist makes a drawing onto the printing surface directly. { 'öd-ö, lith'äg-rä-fē }

autologous [BIOL] Derived from or produced by the individual in question, such as an autologous protein or an autologous graft. { 'ö-täl-ä-gäs }

autoluminescence [ATOM PHYS] Luminescence of a material (such as a radioactive substance) resulting from energy originating within the material itself. { 'öd-ö, lü-mä'nes-äns }

autolysis [GEOCHEM] Return of a substance to solution, as of phosphate removed from seawater by plankton and returned when these organisms die and decay. [PATH] Self-digestion by body cells following somatic or organ death or ischemic injury. { 'ö-täl-ä-säs }

autolysosome See autophagic vacuole. { 'öd-ö, lirsä, söm }

autolytic enzyme [BIOCHEM] A bacterial enzyme, located in the cell wall, that causes disintegration of the cell following injury or death. { 'öd-ä, lid-ik 'en, zim }

Autolytinae [INV ZOO] A subfamily of errantian polychaetes in the family Syllidae. { 'öd-ä, lid-ä-nē }

automanual system [CIV ENG] A railroad signal system in which signals are set manually but are activated automatically to return to the danger position by a passing train. { 'öd-ö, man-yä-wäl 'sis-təm }

automata theory [MATH] A theory concerned with models used to simulate objects and processes such as computers, digital circuits, nervous systems, cellular growth and reproduction. { 'ö-täm-äd-ä 'thē-ä-rē }

automated guided vehicle [IND ENG] In a flexible manufacturing system, a driverless computer-controlled vehicle equipped with guidance and collision-avoidance systems and used to transport workpieces and tools between work stations. Abbreviated AGV. { 'öd-ä, mäd-äd 'gid-äd 'vē-ä-käl }

automated guided vehicle system [CONT SYS] A computer-controlled system that uses pallets and other interface equipment to transport workpieces to numerically controlled machine tools and other equipment in a flexible manufacturing system, moving in a predetermined pattern to ensure automatic, accurate, and rapid work-machine contact. { 'öd-ä, mäd-äd 'gid-äd 'vē-ä-käl 'sis-təm }

automated identification system [COMPUT SCI] In a data processing system, the use of a technology such as bar coding, image recognition, or voice recognition instead of keyboarding for data entry. { 'öd-ä, mäd-äd i, den-tä-fä'kä-shən 'sis-təm }

automated radar plotting aid [NAV] A marine computer-based anticollision system that automatically processes time coordinates of radar echo signals into space coordinates in digital form, determines consecutive coordinates and motion parameters of targets, calculates the predicted closest point of approach and time to closest point of approach and presents them in graphic or alphanumeric form on the radar display, and switches on alarms if there is a danger of collision. { 'öd-ä, mäd-äd 'rä, dār 'pläd-ig, äd }

automated radar terminal system [NAV] A system for carrying out air-traffic control in the vicinity of airports which uses both airport surveillance radar and the air-traffic radar beacon system; radar video, representing aircraft targets, is presented

on the air-traffic controllers' displays, and the automation system automatically tracks controlled aircraft and presents alphanumeric information adjacent to their targets. Abbreviated ARTS. { 'öd-ä, mäd-äd 'rä, dār 'tärm-än-äl 'sis-təm }

automated tape library [COMPUT SCI] A computer storage system consisting of several thousand magnetic tapes and equipment under computer control which automatically brings the tapes from storage, mounts them on tape drives, dismounts the tapes when the job is completed, and returns them to storage. { 'öd-ä, mäd-äd 'tāp 'lī, brer-ē }

automatic [ENG] Having a self-acting mechanism that performs a required act at a predetermined time or in response to certain conditions. [ORD] See automatic weapon. { 'öd-ä, mad-ik }

automatic abstracting [COMPUT SCI] Techniques whereby, on the basis of statistical properties, a subset of the sentences in a document is selected as representative of the general content of that document. { 'öd-ä, mad-ik 'ab, strakt-ig }

automatic alarm receiver [ELECTR] A complete receiving, selecting, and warning device capable of being actuated automatically by intercepted radio-frequency waves forming the international automatic alarm signal. Also known as autoalarm. { 'öd-ä, mad-ik 'älärm ri, sē-vär }

automatic-alarm-signal keying device [COMMUN] A device capable of automatically keying the radiotelegraph transmitter on board a vessel to transmit the international automatic-alarm signal, or to respond to receipt of an internationally agreed-upon distress signal and wake up the radio operator on ships not having a 24-hour radio watch. { 'öd-ä, mad-ik 'älärm 'sig-näl 'kē-ig di, vis }

automatic back bias [ELECTR] Radar technique which consists of one or more automatic gain control loops to prevent overloading of a receiver by large signals, whether jamming or actual radar echoes. { 'öd-ä, mad-ik 'bak, bi-äs }

automatic background control See automatic brightness control. { 'öd-ä, mad-ik 'bak, graünd kən, tröl }

automatic balance [ENG] A balance capable of performing weighing procedures without the intervention of an operator. { 'öd-ä, mad-ik 'ba-läns }

automatic bass compensation [ELECTR] A circuit related to the volume control in some radio receivers and audio amplifiers to make bass notes sound properly balanced, in the audio spectrum, at low volume-control settings. { 'öd-ä, mad-ik 'bäs kām-pän'sä-shən }

automatic batcher [MECH ENG] A batcher for concrete which is actuated by a single starter switch, opens automatically at the start of the weighing operations of each material, and closes automatically when the designated weight of each material has been reached. { 'öd-ä, mad-ik 'bach-är }

automatic bias [ELECTR] A method of obtaining the correct bias for a vacuum tube or transistor through use of a resistor, usually in the cathode or emitter circuit. { 'öd-ä, mad-ik 'bi-äs }

automatic brazing [MET] Brazing by the use of either portable or stationary equipment which does not require constant supervision by the operator. { 'öd-ä, mad-ik 'brä-z-ig }

automatic breech mechanism [ORD] A device that utilizes the energy of recoil, or the pressure of the powder gases, to open the breech, withdraw the fired cartridge case, insert a new cartridge, and close the breech. { 'öd-ä, mad-ik 'brēch, mek-ä'niz əm }

automatic brightness control [ELECTR] A circuit used in a television receiver to keep the average brightness of the reproduced image essentially constant. Abbreviated ABC. Also known as automatic background control. { 'öd-ä, mad-ik 'brī-näs kən, tröl }

automatic calibration [ENG] A process in which an electronic device automatically performs the recalibration of a measuring range of a weighing instrument, for example an electronic balance. { 'öd-ä, mad-ik, kal-ä'brä-shən }

automatic calling unit [COMPUT SCI] A device that enables a business machine or computer to automatically dial calls over a communications network. { 'öd-ä, mad-ik 'köl-ig, yū-nät }

automatic call origination See autocall. { 'öd-ä, mad-ik 'köl-ä, rij-ä'nä-shən }

automatic carriage [COMPUT SCI] Any mechanism designed to feed continuous paper or plastic forms through a printing or writing device, often using sprockets to engage holes in the paper. { 'öd-ä, mad-ik 'kar-ij }

automatic casing hanger [PETRO ENG] Unitized hanger-seal

AUTOLYTINAE



Procerastea of the Syllidae (Autolytinae); dorsal view.

EXHIBIT F

THE
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ret-ro-fire (rèt/rô-fîr') *v.* -fired, -fir-ing, -fires. — *tr.* To ignite or fire (a retrorocket). — *intr.* To become ignited or fired. Used of a retrorocket.

ret-ro-fit (rèt/rô-fît') *v.* -fit-ted, -fit-ting, -fits. — *tr.* 1. To provide (a jet, an automobile, a computer, or a factory, for example) with parts, devices, or equipment not in existence or available at the time of original manufacture. 2. To install or fit (a device or system, for example) for use in or on an existing structure, especially an older dwelling. — *intr.* 1. To fit into or onto equipment already in existence or service. 2. To substitute new or modernized parts or systems for older equipment: *an industrial plant that was retrofitting to meet new safety regulations.* — **retrofit** *n.* 1. Something that has been retrofitted or that has undergone retrofitting. 2. An instance of modernizing or expanding with new or modified parts, devices, systems, or equipment: *a retrofit for the heating system.* — **retrofit** *adj.* Relating to or being a retrofit: *a retrofit kit for the homeowner; an energy-saving retrofit program; a large retrofit market.* — **ret-ro-fit/ta-ble** *adj.* — **ret-ro-fit/ter** *n.*

ret-ro-flex (rèt/râ-flèks') also **ret-ro-flexed** (-flèkst') *adj.* 1. Bent, curved, or turned backward. 2. *Linguistics.* Pronounced with the tip of the tongue turned back against the roof of the mouth. — **retroflex** *n.* *Linguistics.* A sound pronounced with the tongue in retroflex position, as the sound (r) in some varieties of English. [Latin **retroflexus*, past participle of *retroflexere*, to bend back: *retro*, retro- + *flectere*, to bend.] — **ret-ro-flex/ion**, **ret-ro-flex/ion** *n.*

ret-ro-grade (rèt/râ-grād') *adj.* 1. Moving or tending backward. 2. Opposite to the usual order; inverted or reversed. 3. Reverting to an earlier or inferior condition. 4. *Astronomy.* a. Of or relating to the orbital revolution or axial rotation of a planetary or other celestial body that moves clockwise from east to west, in the direction opposite to most celestial bodies. b. Of or relating to the brief, regularly occurring, apparently backward movement of a planetary body in its orbit as viewed against the fixed stars, caused by the differing orbital velocities of Earth and the body observed. 5. *Archaic.* Opposed; contrary. — **retrograde** *intr.v.* -grad-ed, -grad-ing, -grades. 1. To move or seem to move backward. See *Synonyms at recede*. 2. To decline to an inferior state; degenerate. [Middle English, from Latin *retrogradus*, from *retrogradi*, to go back: *retro*-, retro- + *gradus*, walking (from *gradi*, to go; see *ghredh-* in Appendix.)] — **ret-ro-gra-da/tion** (-rô-grâ-dâ'shən) *n.* — **ret-ro-grade/ly** *adv.*

ret-ro-gress (rèt/râ-grès', rèt/râ-grēs') *intr.v.* -gressed, -gress-ing, -gress-es. 1. To return to an earlier, inferior, or less complex condition. 2. To go or move backward. [Latin *retrogradi*, **retrogress* - *retro*-, retro- + *gradi*, to go; see *ghredh-* in Appendix.] — **ret-ro-gres/sive** *adj.* — **re-tro-gres/sive-ly** *adv.*

ret-ro-gres-sion (rèt/râ-grësh'ən) *n.* 1. The act or process of deteriorating or declining. 2. *Biology.* A return to a less complex or more primitive state or stage.

ret-ro-len-tal (rèt/rô-lén'tl) *adj.* Situated or occurring behind a lens, as of the eye. [RETRO- + New Latin *lens*, *lent*-, lens; see LENS + -AL¹.]

ret-ro-oc-u-lar (rèt/rô-ôk'yə-lər) *adj.* Situated behind the eye.

ret-ro-per-i-to-ne-al (rèt/rô-për'i-tn-ē'al) *adj.* Situated behind the peritoneum.

ret-ro-pharyn-ge-al (rèt/rô-fà-rîn'jē-əl, -jəl, -fâr'în-jē'al) *adj.* Situated or occurring behind the pharynx.

ret-ro-rock-et (rèt/rô-rôk'it) *n.* A rocket engine used to retard, arrest, or reverse the motion of a vehicle, such as an aircraft, a missile, or a spacecraft.

re-trorse (rî-trôrs', rê-trôrs') *adj.* Directed or turned backward or downward. [Latin *retro-rsus*, from *retro-versus*: *retro*-, retro- + *versus*, past participle of *vertere*, to turn; see *wer-* in Appendix.] — **re-trorse/ly** *adv.*

ret-ro-spect (rèt/râ-spèkt') *n.* A review, survey, or contemplation of things in the past. — **retrospect** *v.* -spect-ed, -spect-ing, -spect-s. — *intr.* 1. To contemplate the past. 2. To refer back. — *tr.* To look back on or contemplate (things past). — **idiom.** in **retrospect**. Looking backward or reviewing the past. [From Latin **retrospectus*, past participle of *retrospicere*, to look back at: *retro*-, retro- + *specere*, to look at; see *spek-* in Appendix.] — **ret-ro-spec/tion** *n.*

ret-ro-spec-tive (rèt/râ-spèk'tiv) *adj.* 1. Looking back on, contemplating, or directed to the past. 2. Looking or directed backward. 3. Applying to or influencing the past; retroactive. 4. Of, relating to, or being a retrospective: *a retrospective art exhibition.* — **retrospective** *n.* An extensive exhibition or performance of the work of an artist over a period of years. — **ret-ro-spec-tive-ly** *adv.*

re-trous-sé (râ-trôō-sâ', rêt/rôō-) *adj.* Turned up at the end. Used of the nose. [French, past participle of *retrousser*, to turn back, from Old French: *re*-, re- + *trouser*, to tie in a bundle (probably from Vulgar Latin **torsare*, from **torsus*, twisted, variant of Latin *tortus*, past participle of *torquere*, to twist; see *TORQUE*¹).]

ret-ro-ver-sion (rèt/rô-vûr'zhən, -shən) *n.* 1. A turning or tilting backward. 2. The state of being turned or tilted back. [From Latin *retro-versus*, retrorse. See *RETORSE*.]

ret-ro-vi-rus (rèt/rô-vî'rəs, rêt/râ-vî'-) *n.*, *pl.* -rus-es. Any of a group of viruses, many of which produce tumors, that contain

RNA and reverse transcriptase, including the virus that causes AIDS. — **ret-ro-vi'ral** *adj.*

re-try (rê-trî') *tr.v.* -tried (-trîd'), -try-ing, -tries (-trîz'). To try again.

ret-si-na (rèt'sî-nâ, rêt-sē'nâ) *n.* A Greek wine flavored with pine resin. [Modern Greek, probably from Italian *resina*, resin, from Latin *resina*. See *RESIN*.]

re-turn (rî-tûrn') *v.* -turned, -turn-ing, -turns. — *intr.* 1. To go or come back, as to an earlier condition or place. 2. To revert in speech, thought, or practice. 3. To revert to a former owner. 4. To answer or respond. — *tr.* 1. To send, put, or carry back: *We return bottles to the store.* 2. a. To give or send back in reciprocation: *She returned his praise.* b. To give back to the owner: *He returned her book.* c. To reflect or send back: *The echo was returned by the canyon wall.* 3. To produce or yield (profit or interest) as a payment for labor, investment, or expenditure. 4. *Law.* a. To submit (an official report, for example) to a judge or other person in authority. b. To render or deliver (a writ or verdict, for example) to the proper officer or court of law. 5. To elect or reelect, as to a legislative body. 6. *Games.* To respond to (a partner's lead) by leading the same suit in cards. 7. *Architecture.* To turn away from or place at an angle to the previous line of direction. 8. a. *Sports.* To send back (a tennis ball, for example) to one's opponent. b. *Football.* To run with (the ball) after a kickoff, a punt, an interception, or a fumble. — **return** *n.* *Abbr.* **ret.** 1. a. The act or condition of going, coming, bringing, or sending back. b. The act of bringing or sending something back to a previous place, condition, or owner. 2. a. Something brought or sent back. b. **returns.** Merchandise returned, as to a retailer by a consumer or to a wholesaler by a retailer. c. Something that goes or comes back. 3. A recurrence, as of a periodic occasion or event: *the return of spring.* 4. Something exchanged for that received; repayment. 5. A reply; a response. 6. a. The profit made on an exchange of goods. b. Often **returns.** A profit or yield, as from labor or investments. c. Output or yield per unit rather than cost per unit, as in the manufacturing of a particular product. 7. a. A report, list, or set of statistics, especially one that is formal or official. b. Often **returns.** A report on the vote in an election. c. *Chiefly British.* An election. 8. *Games.* A lead in certain card games that responds to the lead of one's partner. 9. *Sports.* In tennis and certain other sports: a. The act of sending the ball back to one's opponent. b. The ball thus sent back. 10. *Football.* a. The act of running back the ball after a kickoff, a punt, an interception, or a fumble. b. The yardage so gained. 11. *Architecture.* a. The extension of a molding, projection, or other part at an angle (usually 90°) to the main part. b. A part of a building set at an angle to the façade. 12. a. A turn, bend, or similar reversal of direction, as in a stream or road. b. A pipe or conduit for carrying something, especially water, back to its starting point. 13. The key or mechanism on a machine, such as a typewriter or computer, that positions the carriage, cursor, or printing element at the beginning of a new line. 14. *Chiefly British.* A roundtrip ticket. 15. *Law.* a. The bringing or sending back of a writ, subpoena, or other document, generally with a short written report on it, by a sheriff or other officer to the court from which it was issued. b. A certified report by an assessor, an election officer, a collector, or another official. 16. A formal tax statement on the required official form indicating taxable income, allowed deductions, exemptions, and the computed tax that is due. In this sense, also called *income tax return*, *tax return*. — **return** *adj.* 1. Of, relating to, or bringing about a going or coming back to a place or situation: *the return voyage; a return envelope.* 2. Given, sent, or done in reciprocation or exchange: *a return volley; a return invitation.* 3. Performed, presented, or taking place again: *a return engagement of the ballet; a return tennis match.* 4. Used on or for returning: *a return route.* 5. Returning or affording return or recirculation: *a return plumbing pipe; a return valve.* 6. Relating to or being a roundtrip ticket. 7. a. Reversing or changing direction. b. Having or formed by a reversal or change in direction: returning on itself, as a bend in a road or stream. — **idiom.** in **return.** In repayment or reciprocation. [Middle English *retornen*, from Old French *retourner*, from Vulgar Latin **retornare*: Latin *re*-, re- + Latin *tornare*, to turn in a lathe; see *TURN*.] — **re-turn'er** *n.*

SYNONYMS: return, revert, recur, recrudescence. These verbs refer to coming or going back, as to a place, position, or condition. Return is the least specific: "Thus with the year/Seasons return" (John Milton). "Not the poem which we have read, but that in which we return . . . possesses the genuine power, and claims the name of essential poetry" (Samuel Taylor Coleridge). "I shall return" (Douglas MacArthur). Revert refers to returning to an earlier, often less desirable condition, practice, subject, or belief: "Part of them . . . reverted to their former prejudices in regard to Lincoln" (Baron Charnwood). Recur means to occur or come up again, often repeatedly: *We thought we had disposed of the problem, but it kept recurring.* To recrudescence is to come into renewed activity after a period of quiescence: "It [a visual art genre] has wilted in latter decades, but recrudesces in recent years" (Earl W. Count). See also *Synonyms at reciprocate*.

re-turn-a-ble (rî-tûr'nâ-bəl) *adj.* 1. That can be returned or brought back: *returnable bottles and cans; returnable merchandise.* 2. *Law.* Required to be returned within a specified time: *returnable writ.* — **returnable** *n.* An empty beverage container that may be returned for refund of a deposit.

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place a tax on (income, property, or goods). 2. To exact a tax from. 3. *Law*. To assess (court costs, for example). 4. To make difficult or excessive demands upon: a boss who taxed everyone's patience. 5. To make a charge against; accuse: He was taxed with failure to appear on the day appointed. [Middle English, from *taxen*, to tax, from Old French *taxer*, from Medieval Latin *taxāre*, from Latin, to touch, reproach, reckon, frequentative of *tangere*, to touch. See *tag-* in Appendix.] —*tax'er* *n*.

tax- *pref.* Variant of *taxo-*.

tax-a (tāk'sā) *n.* Plural of *taxon*.

tax-a-ble (tāk'sā-bəl) *adj.* Subject to taxation: *taxable income*. —*taxable* *n.* One that is subject to taxation: *taxables* such as cigarettes and liquor. —*tax'a-bil'i-ty*, *tax'a-ble-ness* *n.* —*tax'a-bly* *adv.*

tax-a-tion (tāk-sā'shən) *n.* 1. *a.* The act or practice of imposing taxes. *b.* The fact of being taxed. 2. An assessed amount of tax. 3. Revenue gained from taxes.

Tax-co (tās'kō). A town of southern Mexico south-southwest of Mexico City. An important mining town founded in 1529, it is a popular resort center. Population, 36,315.

tax-de-duct-i-ble (tāks'dī-dūkt'ā-bəl) *adj.* Exempt from inclusion in one's taxable income.

tax-eme (tāk'sēm') *n.* *Linguistics*. A minimal linguistic feature, such as the order or stress of words in a compound or phonemes in a word. —*tax-e'mic* *adj.*

tax-es (tāk'sēz) *n.* *Biology & Medicine*. A plural of *taxis*.

tax evasion *n.* Intentional avoidance of tax payment usually by inaccurately declaring taxable income.

tax-ex-empt (tāks'ig-zēmt') *adj.* 1. Not subject to taxation, as the capital or income of a philanthropic organization. 2. Producing interest that is exempt from income tax: *tax-exempt bonds*. —*tax-exempt* *n.* A tax-exempt security.

tax-free (tāks'frē') *adj.* Not subject to taxation; tax-exempt.

tax-i (tāk'sē) *n.*, *pl.* **tax-is** or **tax-ies**. A taxicab. —*taxi* *v.*

tax-ied (tāk'sēd), **tax-i-ing** or **tax-y-ing**, **tax-ies** or **tax-is** (tāk'sēz), —*intr.* 1. To be transported by taxi. 2. To move slowly on the ground or on the surface of the water before takeoff or after landing: an airplane taxiing down the runway. —*tr.* 1. To transport (someone or something) by or as if by taxi: *taxied the children to dance class*; *taxi documents to a law office*. 2. To cause (an aircraft) to taxi. [Short for *TAXIMETER*, or *TAXICAB*.]

WORD HISTORY: "Taxi" is much easier to yell into the traffic than *taximeter cabriolet*, the form from which *taxi* has ultimately been shortened. *Taximeter* comes from the French word *taximètre*, ultimately derived from Medieval Latin *taxāre*, "to tax," and the French combining form *-mètre*. *Taximètre* originally meant, as did its English companion, "a device for measuring distance traveled," but this device was soon adapted to measure waiting time and compute and indicate the fare as well. *Taximeter*, first recorded in English in 1898 (an earlier form, *taxameter*, borrowed through French from German, was recorded in 1894), joined forces with *cab*, a shortening (1827) of *cabriolet*, "a two-wheeled, one-horse carriage." This word, first found in English in 1766, came from French *cabriolet*, of the same meaning, which in turn was derived from *cabriole*, "caper," because the vehicle moves along with a springing motion. *Cab*, the shortened form, was applied to other vehicles as well, including eventually public conveyances. Fitted with a taximeter, such a vehicle, first horse-drawn and then motorized, was known as a *taxameter cab* (1899), a *taximeter cab* (1907), and a *taxicab* (1907), among other names, including *taxi* (1907), a shortening of either *taximeter* or *taxicab*. Interestingly enough, the fullest form possible, *taximeter cabriolet*, is not recorded until 1959.

taxi- *pref.* Variant of *taxo-*.

tax-i-cab (tāk'sē-kāb') *n.* An automobile that carries passengers for a fare, usually calculated by a taximeter. [TAXI(METER) + CAB¹.]

taxi dancer *n.* A woman employed, as by a dance hall or nightclub, to dance with the patrons for a fee. [From the fact that the dancers are hired, like taxis, for a short period of time.]

tax-i-der-my (tāk'sī-dūr'mē) *n.* The art or operation of preparing, stuffing, and mounting the skins of dead animals for exhibition in a lifelike state. —*tax'i-der'mal*, *tax'i-der'mic* *adj.* —*tax'i-der'mist* *n.*

tax-i-me-ter (tāk'sē-mē'tər) *n.* An instrument installed in a taxicab to measure distance traveled and waiting time and to compute and indicate the fare. [French *taximètre*, alteration of *taxamètre*, from German *Taxameter*: Medieval Latin *taza*, tax (from *taxāre*, to tax; see *TAX*) + *-meter*, meter (from Greek *metron*, measure; see *-METER*).]

tax-i-met-rics (tāk'sā-mēt'rīks) *n.* (used with a sing. verb). See *numerical taxonomy*.

tax-ing (tāk'sīng) *adj.* Burdensome; wearing: a *taxing business schedule*. —*tax'ing-ly* *adv.*

tax-is (tāk'sīs) *n.*, *pl.* **tax-es** (tāk'sēz). 1. *Biology*. The responsive movement of a free-moving organism or cell toward or away from an external stimulus, such as light. 2. *Medicine*. The moving of a body part by manipulation into normal position, as after a dislocation, fracture, or hernia. [Greek, arrangement, from *tassein*, *tattein*, *tag-*, to arrange.]

—*taxis* *suff.* 1. Order; arrangement: *homotaxis*. 2. Responsive

movement; *taxis*: *chemotaxis*. [Greek, from *taxis*. See *TAXIS*.]

taxi squad *n.* *Football*. 1. A group of professional players who are under contract to and practice with a team but are ineligible to play in official games. 2. The four extra players on the roster of a professional team who are prepared to join the team on short notice, as to substitute for injured players.

taxi stand *n.* A reserved area where waiting taxicabs are parked.

tax-i-way (tāk'sē-wā') *n.* A usually paved strip at an airport for use by aircraft in taxiing to and from a runway.

tax-man (tāks'mān') *n.* One that is responsible for the collection of federal, state, or local taxes.

taxo- or **taxi-** *pref.* Order; arrangement: *taxonomy*. [From Greek *taxis*. See *TAXIS*.]

tax-on (tāk'sōn') *n.*, *pl.* **tax-a** (tāk'sā). *Biology*. A taxonomic category or group, such as a phylum, order, family, genus, or species. [New Latin, back-formation from *TAXONOMY*.]

tax-o-nom-ic (tāk'sā-nōm'ik) also **tax-o-nom-i-cal** (-i-kəl) *adj.* Of or relating to taxonomy: a *taxonomic designation*. —*tax'o-nom'i-cal-ly* *adv.*

tax-on-o-my (tāk-sōn'ō-mē) *n.*, *pl.* **-mies**. 1. The classification of organisms in an ordered system that indicates natural relationships. 2. The science, laws, or principles of classification; systematics. 3. Division into ordered groups or categories: "Scholars have been laboring to develop a taxonomy of young killers" (Aric Press). [French *taxonomie*: Greek *taxis*, arrangement; see *TAXIS* + *-nomie*, method (from Greek *-nomia*; see *-NOMY*).] —*tax-on'o-mist* *n.*

tax-pay-er (tāks'pā'ər) *n.* One that pays taxes or is subject to taxation. —*tax'pay'ing* *adj.*

tax return *n.* See *return* (sense 16).

tax shelter *n.* A financial operation, such as the use of special depletion allowances, that reduces taxes on current earnings. —*tax'-shel'tered* (tāks'shēl'tərd) *adj.*

-taxy *suff.* Order; arrangement: *phyllotaxy*. [Greek *-taxis*, from *taktos*, arranged. See *TAXIS*.]

Tay (tā). A river of central Scotland rising in the Grampian Mountains and flowing about 190 km (118 mi) through **Loch Tay** to the **Firth of Tay**, an inlet of the North Sea.

Ta-yg-e-ta (tā-ij'i-tā) *n.* 1. *Greek Mythology*. One of the Pleiades. 2. One of the six visible stars in the Pleiades cluster. [Lat-in *Taygetē*, from Greek *Taugetē*.]

Tay-lor (tā'lar). A city of southeast Michigan, a suburb of Detroit. Population, 77,568.

Taylor, Edward. 1645?–1729. English-born American Puritan cleric and poet. Although his works were unpublished until 1939, he is now recognized as one of colonial America's finest poets.

Taylor, Elizabeth. Born 1932. British-born American actress. A childhood star after her appearance in *National Velvet* (1944), she later won an Academy Award for *Butterfield 8* (1960) and for *Who's Afraid of Virginia Woolf?* (1966).

Taylor, (James) Bayard. 1825–1878. American writer known especially for his travel books and his translation (1870–1871) of Goethe's *Faust*.

Taylor, Jeremy. 1613–1667. English bishop and writer whose most important works are *The Rule and Exercises of Holy Living* (1650) and *The Rule and Exercises of Holy Dying* (1651).

Taylor, (Joseph) Deems. 1885–1966. American composer and critic. He composed the suite for *Through the Looking Glass* (1918) and wrote *The Well-Tempered Listener* (1940).

Taylor, Laurette. 1884–1946. American actress best known for her portrayal of Amanda Wingfield in Tennessee Williams's *The Glass Menagerie*.

Taylor, Paul. Born 1930. American choreographer whose avant-garde work includes *Three Epitaphs* (1956) and *Orbs* (1966).

Taylor, Tom. 1817–1880. British playwright whose works include *Our American Cousin* (1858).

Taylor, Zachary. Known as "Old Rough and Ready." 1784–1850. The 12th President of the United States (1849–1850). An army officer in the Black Hawk War (1832) and the Second Seminole War (1835–1837), he became a national hero during the Mexican War (1846–1848) and was elected President in 1848. He died after less than two years in office.

Tay-lors-ville (tā'larz-vīl'). A community of north-central Utah, a suburb of Salt Lake City. Population, 17,448.

Tay-myrr Peninsula (tī-mīr'). See *Taimyr Peninsula*.

tay-ra (tī'rā) *n.* A small South American carnivore (*Eira bar-bata*) closely related to the marten, having a broad head, slender body, and short dense fur. [Portuguese or Spanish *taira*.]

Tay-Sachs disease (tā'sāks') *n.* A hereditary disease that affects young children almost exclusively of eastern European Jewish descent, in which an enzyme deficiency leads to the accumulation of gangliosides in the brain and nerve tissue, resulting in mental retardation, convulsions, blindness, and, ultimately, death. [After Warren Tay (1843–1927), British physician, and Bernard Sachs (1858–1944), American neurologist.]

taz-za (tāt'sā, -tsā) *n.* A shallow ornamental vessel usually on a pedestal. [Italian, cup, tazza, from Arabic *taṣṭ*, basin.]

Tb¹ The symbol for the element *terbium*.

Tb² *abbr.* Bible. *Tobit*.

TB also **T.B.** *abbr.* Tuberculosis.

t.b. *abbr.* 1. Trial balance. 2. Also **T.B.** Tubercle bacillus.



Zachary Taylor

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Stress marks: ' (primary);
' (secondary), as in
dictionary (dīk'shə-nēr'ē)

EXHIBIT G

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 2765
Examiner: M. Irshadullah

In re Patent Application of:

Applicant: David S. Miller

Appln No.: 09/073,027

Filed: May 7, 1998

For: FULLY-AUTOMATED SYSTEM FOR TAX
REPORTING, PAYMENT AND REFUND

Atty Dkt: 31921-140380 (formerly MILDA 0001.03)



REQUEST FOR
RECONSIDERATION

November 24, 1999

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action mailed September 15, 1999, this Request for
Reconsideration is respectfully submitted.

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REMARKS

The Applicant has carefully and thoughtfully considered the Action and the comments therein. For the reasons given below, it is submitted that this application is in condition for allowance.

1. The Applicant kindly thanks Examiner Irshadullah and Primary Examiner Stamber for the personal interview on November 3, 1999. The substance of the interview is recorded in the interview summary provided to Applicant's Representative at the interview. As indicated at the

bottom of the Interview Summary, the Applicant is not required to provide a separate record of the substance of the interview.

2. In the Action on pages 2-9 in section 2, claims 1-20 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,193,057 to Longfield (hereinafter Longfield) in view of U.S. Patent No. 5,138,549 to Bern (hereinafter Bern). Applicants respectfully traverse this rejection.

As per claim 1, the combination of references does not teach the claimed invention. Claim 1 recites a method for automatic tax reporting by an electronic intermediary. The method comprises the steps of connecting electronically the electronic intermediary to a tax data provider and collecting electronically tax data from the tax data provider. Referring to Figure 2 of the specification, the electronic intermediary 21 is separate from the taxpayer 20. As discussed in the specification, for example, on page 11 at line 17 to page 12 at line 2, the term "taxpayer" refers to an individual or other entity, such as a trust, estate, corporation, or partnership, who has tax liability or must file a tax return, and the term "electronic intermediary" refers to a data processing system comprising a general purpose computer and a computer program for performing the invention.

The electronic intermediary is connected electronically to a tax data provider. As discussed in the specification, for example, on page 12 at lines 2-10, the term "tax data provider" refers to a party that has tax information relevant to the taxpayer's tax liability or tax reporting obligations. As illustrated in figure 2, non-limiting examples of a tax data provider include the taxpayer's employers 22, the taxpayer's bank 23, the taxpayer's brokerage firms 24, the taxpayer's charities 25, the taxpayer's other tax data providers 26, and taxing authorities 27. As

illustrated in block 12 of Figure 1 and discussed in the specification, for example, on page 15 beginning at line 6, tax data is collected electronically from a tax data provider. As discussed in the specification on page 17 at lines 1-7, with the electronic collection of tax data, the invention eliminates the current requirement that a taxpayer manually collect the tax data, eliminates the current requirement that a taxpayer manually enters such tax data onto a tax return or into a computer, and eliminates the need for all, or virtually all, intermediate hard copies of tax data, thereby saving paper, time, and cost.

In contrast to the claimed invention and as recognized by the Action on page 3, Longfield does not teach connecting electronically an electronic intermediary to a tax data provider and collecting electronically tax data from the tax data provider. Instead, Longfield teaches manually collecting tax data and manually entering the collected tax data into a personal computer by using a keyboard. Longfield, column 2, lines 14-23; column 3, lines 40-41, 46-47, and 56-58. Hence, Longfield fails to teach the claimed invention.

Just like Longfield, Bern fails to teach the claimed invention and fails to overcome the deficiencies of Longfield. Bern does not teach connecting electronically an electronic intermediary to a tax data provider and collecting electronically tax data from the tax data provider. In fact, Bern does not teach any steps related to determining tax liability. Instead, Bern teaches a method for a depositor to deposit funds electronically to pay a tax liability. Bern, column 1, line 16, to column 2, line 15; especially, column 1, line 16-21 and 32-42; column 2, lines 19-34. In addition to failing to teach anything related to determining tax liability, Bern only teaches manually entering data into a computer using a touch tone telephone, a keyboard, or speech recognition. Bern, column 7, lines 33-38; column 2, lines 62-64. Hence, Bern, does not teach the claimed invention and does not overcome the deficiencies of Longfield. In addition,

the combination of Longfield and Bern fails to teach the claimed invention. Consequently, the Action has failed to establish a prima facie case of obviousness for claim 1, and it is respectfully submitted that claim 1 is allowable.

Claims 2-14 variously depend from claim 1 and are allowable as being dependent from an allowable claim.

As per claim 15, the combination of references fails to teach the claimed invention. Claim 15 recites an apparatus for automatic tax reporting by an electronic intermediary. The apparatus includes means for connecting electronically an electronic intermediary to a tax data provider and means for collecting electronically tax data from the tax data provider. Just as the combination of Longfield and Bern fails to teach similar method steps in claim 1, the combination of references likewise fails to teach the apparatus limitations as recited in claim 15. Consequently, the Action has failed to establish a prima facie case of obviousness, and claim 15 is allowable.

Claims 16-18 are dependent from claim 15 and are allowable as being dependent from an allowable claim.

As per claim 19, the combination of Longfield and Bern fails to teach the claimed invention. Claim 19 recites a computer-readable medium embodying a computer program for automatic tax reporting by an electronic intermediary. The computer program includes code segments for connecting electronically an electronic intermediary to a tax data provider and collecting electronically tax data from the tax data provider. Just as the combination of references fails to teach similar steps in claim 1, the combination of references likewise fails to teach the code segments limitations embodied on a computer-readable medium as recited in

claim 19. Consequently, the Action has failed to establish a prima facie case of obviousness, and claim 19 is allowable.

As per claim 20, the combination of Longfield and Bern fails to teach the claimed invention. Claim 20 recites a method for automatic tax reporting by an electronic intermediary. The method includes the steps of connecting electronically an electronic intermediary to a tax data provider and collecting electronically tax data from the tax data provider. Just as the combination of references fails to teach these steps as recited in claim 1, the combination of references likewise fails to teach these steps as recited in claim 20. Consequently, the Action has failed to establish a prima facie case of obviousness, and claim 20 is allowable.

THEREFORE, because all rejections have been overcome, it is submitted that claims 1-20 are allowable and such allowance is requested.

Respectfully submitted,



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